The Entrepreneurial Imperative for Korea:

Building a Case for a Korean Entrepreneurship Ecosystem through an Assessment of University Entrepreneurship Centres and Student Satisfaction

By

Manish Joshi

THESIS

Submitted to

KDI School of Public Policy and Management

in partial fulfilment of the requirements

for the degree of

MASTER OF PUBLIC POLICY

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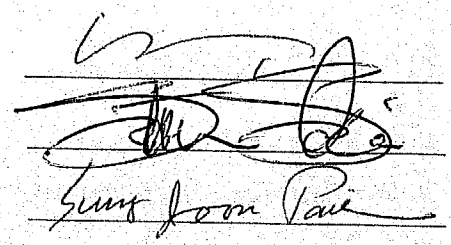
Committee in charge:

Professor Tae Jong KIM, Supervisor

Professor Stanley SAKAI

Professor Sung-Joon PAIK



Approval as of August, 2014

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Last but not the least, the entire staff at KDI School especially the student & academic affairs team for helping with the logistics and the process of submitting the thesis.

Table of Contents

Statement of Purpose 4
Thesis Statement 5
Research Questions 9
Statement of Significance 11
Literature Review 12
Methodology 16
Data 17
Empirical Analysis 19
Results of the Regression Analysis 22
Heteroskedasticity & Robust Results 26
Conclusion 28
Bibliography 29

Statement of Purpose

The twin problems of an overqualified workforce and the heavy dependence of the economy on family-owned conglomerates are high among the critical issues that threaten the sustainable growth of the Korean economy. Time has come for Korea to recognize and act on the entrepreneurial imperative – to inculcate an entrepreneurial outlook among the young population.

The common solution to the abovementioned problems is to invest in the creation of an ecosystem for entrepreneurship development. One of the key elements of such an ecosystem is entrepreneurship education at the undergraduate and graduate level. In Korea the focus on entrepreneurship education is fairly recent and is mainly driven by the University Entrepreneurship Centres established with support from the Ministry of Education in 2011.

The aim of this thesis is two-fold. First, it seeks to understand the characteristics of University Entrepreneurship Centres with respect to factors such as nature and structure of courses, faculty, facilities and finances. This would be helpful in assessing the performance of the University Entrepreneurship Centres and developing a rating system to rank these centres. Second, it will attempt to link the characteristics of the University Entrepreneurship Centres to the satisfaction of students (who have participated in educational programs conducted by these centres) in order to isolate the Centre-level factors that improve the student experience.

Moreover, the thesis will also try to resolve two key challenges: the lack of common framework that defines a national curriculum for Entrepreneurship Education and the subjective nature of student satisfaction, by offering potential solutions and concrete next steps.

Thesis Statement

Main Claim: Student satisfaction and experience are a function of various factors that define the University Entrepreneurship Centres such as level of activity, nature of programs, number and experience of faculty, budget/endowment, level of independence and ranking of the university. Changes in student satisfaction due to potential differences in Entrepreneurship Centre-level factors across universities can be measured only in the presence of a common curriculum that standardizes the educational methodology and input.

Sub Claim 1: The level of activity (number of programs) and nature of entrepreneurship programs conducted by the University Entrepreneurship Centres is correlated with student satisfaction/experience.

More active Entrepreneurship Centres engage the participating students better by offering a large number of diverse programs and this leads to higher student satisfaction. Programs differ in their structure, pedagogy and delivery as well. By design, some programs offer more concrete takeaways and such programs could lead to higher student satisfaction.

Sub Claim 2: The level of funding, i.e., university budget and government support (grants) given to a University Entrepreneurship Centre has a positive correlation with student satisfaction/experience and higher ranked universities show a higher correlation. We typically expect better funded universities to offer a higher number and broader range of programs. More funding also enables Entrepreneurship Centres to invest in highly qualified staff/faculty and offer more support services such as business incubation facilities.

Sub Claim 3: The subjective nature of student satisfaction makes it difficult to measure and the current satisfaction surveys need to be modified or upgraded significantly in order to better capture the student experience. Most University Entrepreneurship Centres have been operational for 2 years and an estimated 8,000 to 10,000 students have participated in the programs. The current student satisfaction survey captures data from 4700 students.

Student satisfaction is a nebulous concept simply because it lacks a strict definition and varies with the personal characteristics of the respondent. For example, for some students seemingly trivial things like quality of food in the cafeteria might dictate the overall satisfaction they derive from the program. Satisfaction levels also depend on the past experiences of the respondents; for example, highly motivated and talented students (typically assumed to be found in higher ranked universities) would usually extract the best from any education program and would hence be more satisfied. Another case may be that students exposed to an entrepreneurial environment at an early age exhibit higher satisfaction such as students whose parents or close relatives are entrepreneurs. These students tend to be more familiar with entrepreneurial concepts. One solution is to explicitly control for such possible bias by capturing proxy information such as student grade point average (measure of student ability) or family background and incorporate it in the analysis. Therefore specific questions that capture the change in entrepreneurial intent of the respondents need to be drafted very carefully in order to reduce the level of subjectivity.

Another challenge is how to track the recent graduates of the Entrepreneurship Programs and survey them after they have gone back to the job market in order to verify the effectiveness of the programs. While this may be a good way to assess the effectiveness of an entrepreneurship program, it is a time-consuming and expensive exercise to undertake.

Moreover, it is logistically difficult to track the career changes of alumni in sufficiently large numbers.

Sub Claim 4: In the absence of a common framework that defines a national curriculum for Entrepreneurship education, it is very difficult to establish a causal link between centre-level factors and student satisfaction/experience.

Currently there is no common curriculum followed by the Entrepreneurship Centres. This means that students in various universities go through programs that differ in the pedagogy, learning goals and structure. It is easy to see why this is a serious problem when one tries to measure student satisfaction. Students are rating totally different stimuli and thus it's impossible to have a comparable measure of student satisfaction. For example a student who went through an intensive, weeklong business plan workshop is likely to rate his satisfaction very differently than a student who went through series of run-of-the-mill guest lectures on business fundamentals.

Research Questions

Sub Claim 1

- Which programs result in higher student satisfaction?
- Why do certain programs lead to higher satisfaction among students?

Sub Claim 2

- What is the mechanism through which higher funding translates into higher satisfaction of students? For example, does higher funding increase number of programs or the quality of faculty or the participation of external experts?
- Does higher funding imply more innovation by the Entrepreneurship Centre in its efforts to create new content and programs?

Sub Claim 3

- Which factors show increase in the entrepreneurial intent of the students?
- How can attitudinal change of students be measured? What kind of questions should be asked to capture the attitude shift?
- Will tracking the same set of alumni over a period of time provide any insights about the effectiveness of the program? What should be the criteria for such a long term evaluation?

Sub Claim 4

- Is it feasible to create a common curriculum for entrepreneurship education? What specific elements would constitute such a framework?
- Which actors/stakeholders should be involved in the creation of a common curriculum? Should entrepreneurs and business people take the lead in designing the entrepreneurship curriculum in partnership with academia?

- Is a comparative analysis of entrepreneurship curricula of other Asian countries a good starting point for the creation of a common curriculum for Korea? While importing curriculum from other countries such as United States of America, what cultural differences need to be kept in mind and what aspects of the curriculum need to be suitably adapted to suit the local reality?
- How could such a proposal be presented to the relevant government departments such as the Ministry of Education and Small and Medium Business Administration (SMBA)? What is the necessary groundwork that needs to be done to build a strong case for a necessary policy change?

Statement of Significance

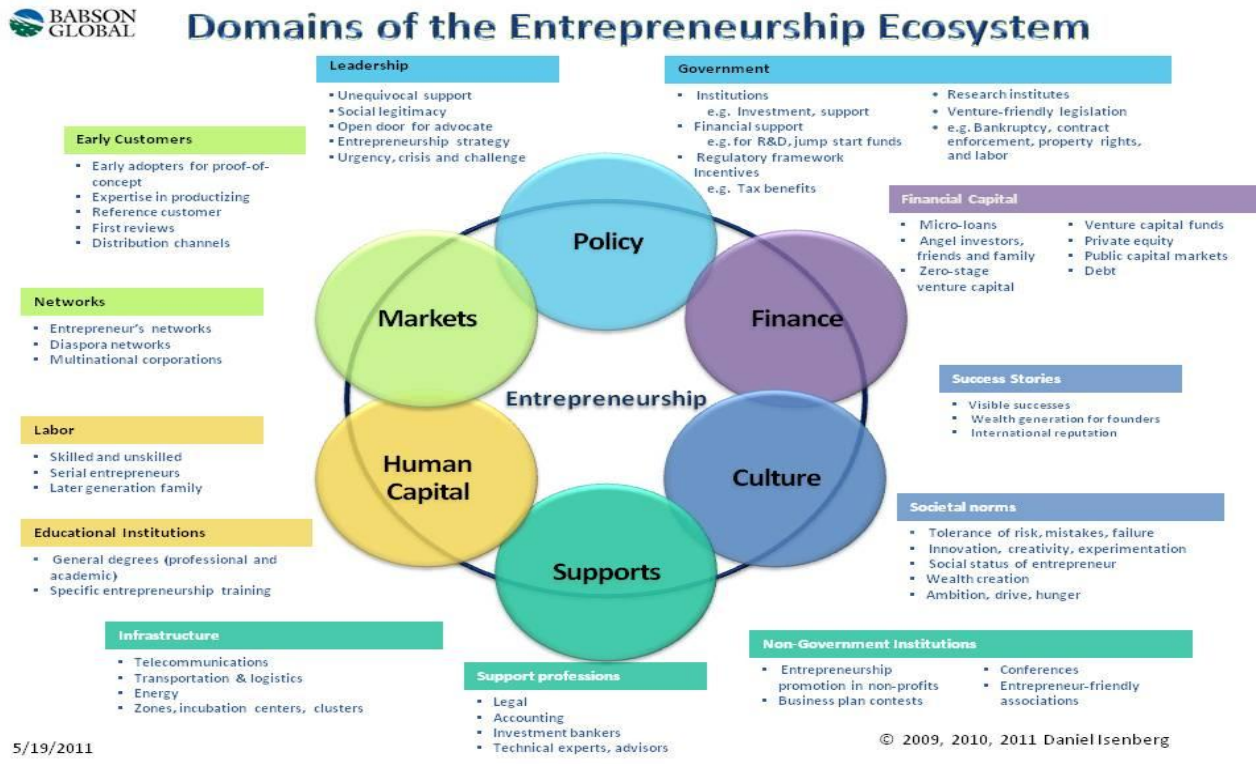
As mentioned before in the introductory text, the twin problems of an overqualified workforce and the heavy dependence of the economy on family-owned conglomerates are the critical issues that threaten the sustainable growth of the country.

Currently, there is no systematic assessment and evaluation of entrepreneurship education activities in Korea at both the entrepreneurship centre and individual student levels. This means that the learning outcomes and behavioural impact of the entrepreneurship educational programs are at best ambiguous. While it is a challenging task, after the successful completion of an entrepreneurship education program we should be able to answer questions such as, Do students feel confident and inspired to start a venture? Are the students willing to work in a startup enterprise upon graduation? What were the key skills gained through the entrepreneurship training programs? Otherwise, precious taxpayer money is being spent on educational programmes that do not have any specific impact.

Literature Review

There are no comparable studies that focus on linking student satisfaction and experience with the University Entrepreneurship Centre programs. Moreover, the body of research on entrepreneurship education in Korea is limited. So the literature review examines various articles and papers that throw light on the following elements:

- The definition and concept of entrepreneurship education
- Status of entrepreneurship education in US, Europe and Korea
- Characteristics of University Entrepreneurship Centres in United States and the growth of entrepreneurship education as an academic discipline in America.



What are the components of an entrepreneurship ecosystem? According to Babson College, such an ecosystem is formed by the interaction of financial capital, culture of risk taking, human networks that support mentoring, educational institutions that impart relevant skills and markets that reward innovation etc.

One of the key elements of such an ecosystem is entrepreneurship education at the undergraduate and graduate level. Thus it is essential to understand what entrepreneurship education encapsulates within its concept.

"A core objective of entrepreneurship education is that it differentiates from typical business education. Business entry is fundamentally a different activity than managing a business…." Solomon, Duffy and Tarabishy (2002)

"To this end, entrepreneurial education must include skill building courses in negotiation, leadership, new product development, creative thinking and exposure to technological innovation" (McMullen and Long, 1987; Vesper and McMullen, 1988)

Other areas identified as important for entrepreneurial education included awareness of entrepreneur career options, sources of venture capital, ambiguity tolerance and the challenges associated with each stage of venture development.

In his comprehensive study of the academic discipline of entrepreneurship in America, Jerome A. Katz charts the growth of entrepreneurship education in America. Katz (2003) points out that since the first entrepreneurship course was taught in Harvard in 1947, "an American infrastructure has emerged consisting of more than 2200 courses at over 1600 schools, 277 endowed positions, 44 English-language refereed academic journals and over 100 centres."[1]

Katz offers a chronology covering three domains, namely courses, other infrastructure elements and publications. The author concludes by observing that

[1] Katz, Jerome A, "The chronology and intellectual trajectory of American entrepreneurship education 1876–1999." *Journal of Business Venturing* 18 (2003): 284.

entrepreneurship education in America has reached a level of maturity and future growth in the field is likely to come from research and educational innovation not only "outside the business schools" but also "outside the USA," referring to the rapid growth of entrepreneurship education in Europe and Asia.[2]

Katz also summarizes in his paper the major problems in the field of entrepreneurship education in USA namely "a glut of journals, a narrowing focus on top-tier publications, potential American stagnation and a shortage of faculty overall exacerbated by a shortage of PhD programs."[3]

Katz's paper is relevant because it helps in understanding how entrepreneurship education evolved in USA, the country with the most developed curriculum and infrastructure. It clearly outlines the challenges that the field of entrepreneurship education faces in America today and some of these challenges are applicable to countries such as Korea that are just beginning to enter the field of entrepreneurship education.

Another important research work that furthers our understanding of University Entrepreneurship Centres is a study titled *An Examination of Entrepreneurship Centers in the United States: A National Survey.* Finkle, Kuratko and Goldsby (2006) in their analysis of 146 entrepreneurship centres in the United States explore the characteristics of the entrepreneurship centres and then examine the differences between top ranked & non-ranked centres. While the paper does not link student satisfaction to University Entrepreneurship Centres, it does provide a good basis for studying the Centre-level factors. The findings of the study indicate that "top-ranked centres have three times as many

[2] Ibid., 283
[3] Ibid.

endowed chairs as non-ranked centres. Top-ranked centres also offer more comprehensive graduate programs. Overall, top-ranked centres have more resources and personnel."[4]

The conclusion drawn in this paper is fairly obvious and intuitive since it is a simple presentation of facts as captured by the national survey. But it is the most comprehensive survey of its kind and is a good starting point for anyone who wishes to study University Entrepreneurship Centres.

The last paper evaluated as part of the literature review was by Jumi Kim and Jaepil Park, titled "The Status of Entrepreneurship Education in Korea." The paper presents findings of a survey conducted with five graduate schools of Entrepreneurship Education in Korea and presents the status of courses, scholarships and faculty. More importantly, Kim and Park forward recommendations for government, entrepreneurship education institutions and the five graduate schools surveyed.[5]

The three secondary sources examined in the literature review provide a good starting point for thinking about University Entrepreneurship Centres and how future research could be conducted. They provide some relevant information about the status of entrepreneurship education in Korea and USA.

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[4] Kuratko, Donald F, Michael G. Goldsby and Todd A. Finkle., "An Examination of Entrepreneurship Centers in the United States: A National Survey." *Journal of Small Business Management* 2006 44(2): 184.

[5] Kim, Jumi and Park, Jaepil., "The Status of Entrepreneurship Education in Korea" http://sbaer.uca.edu/research/icsb/2009/paper23.pdf.

Methodology

The research design is revolves around collecting primary data via two survey questionnaires and then analysing the data using OLS regression model.

The first survey captures the data from University Entrepreneurship Centres on factors such number and nature of program, student enrolment, faculty and finances among others. The second survey captures the data from students on their satisfaction with the entrepreneurship programs.

Using OLS regression technique treating student satisfaction as the dependent variable and the various centre-level factors as independent variables, the change in student satisfaction due to a unit change in various centre-level factors will be measured at different levels of significance.

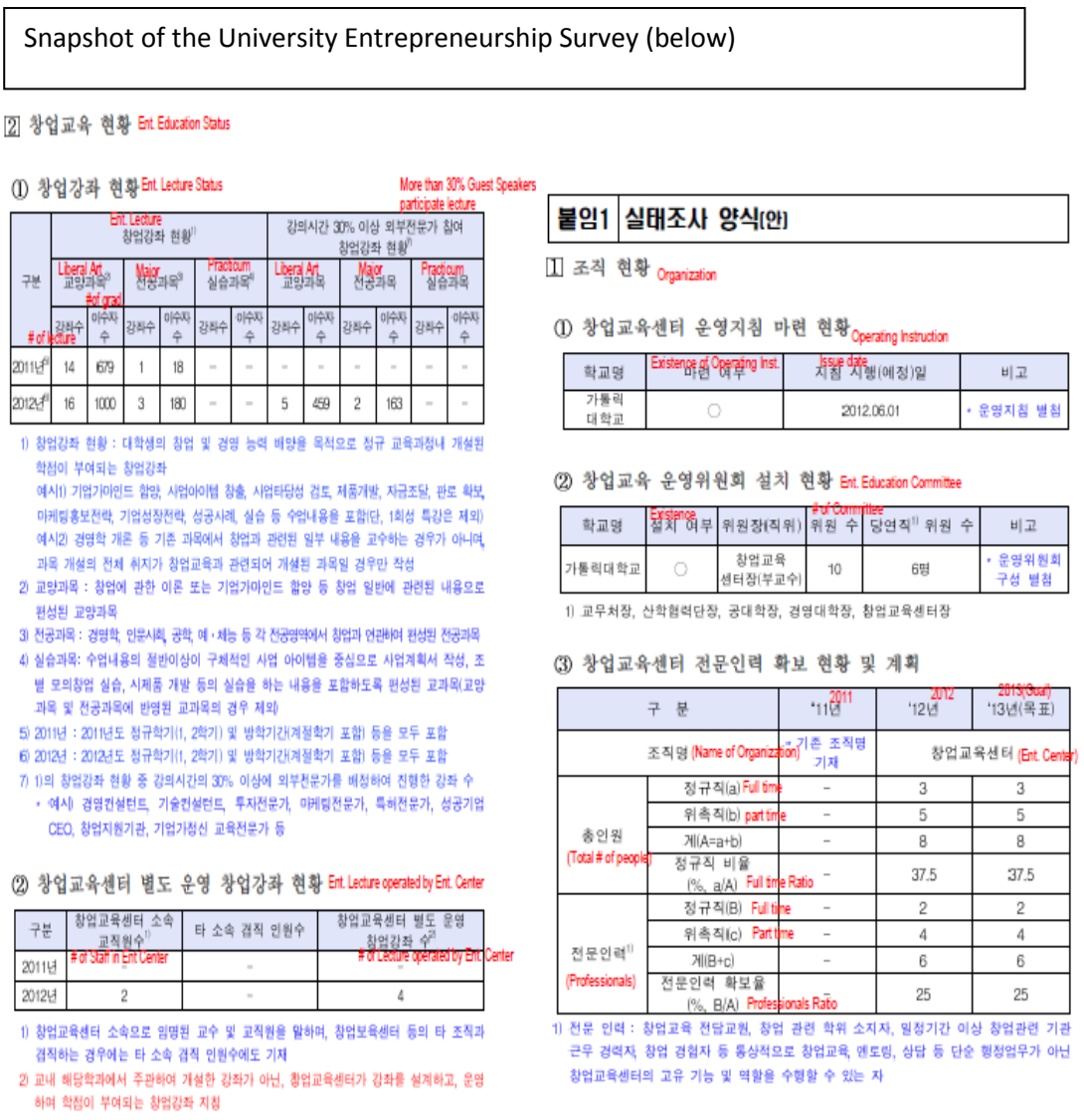
On the basis of the results of the statistical analysis, inference regarding the potential relationship between student satisfaction and centre-level factors will be drawn.

Data

There are 2 data sets that are used in the analysis – Entrepreneurship Centre data and Student Satisfaction data

- Entrepreneurship Centre Survey that collects information from University Entrepreneurship Centres about their activities and operations such lectures & other activities related to entrepreneurship, level student participation in lectures/activities, number of faculty & staff, support for student startups, budget etc. 50 university entrepreneurship centres participated in the survey.

Snapshot of the University Entrepreneurship Survey (below)



2 창업교육 현황 Ent. Education Status

① 창업강좌 현황 Ent. Lecture Status

More than 30% Guest Speakers participate lecture

구분	Ent. Lecture 창업강좌 현황						강의시간 30% 이상 외부전문가 참여 창업강좌 현황					
	Liberal Art 교양과목		Major 전공과목		Practicum 실습과목		Liberal Art 교양과목		Major 전공과목		Practicum 실습과목	
# of lecture	강좌수	이수자 수	강좌수	이수자 수	강좌수	이수자 수	강좌수	이수자 수	강좌수	이수자 수	강좌수	이수자 수
2011년	14	1679	1	18	-	-	-	-	-	-	-	-
2012년	16	1000	3	180	-	-	5	459	2	163	-	-

1) 창업강좌 현황 : 대학생의 창업 및 경영 능력 배양을 목적으로 정규 교육과정내 개설된 학점이 부여되는 창업강좌
예시1) 기업가마인드 함양, 사업아이템 창출, 사업타당성 검토, 제품개발, 자금조달, 판로 확보, 마케팅홍보전략, 기업성장전략, 성공사례, 실습 등 수업내용을 포함(단, 1회성 특강은 제외)
예시2) 경영학 개론 등 기존 과목에서 창업과 관련된 일부 내용을 교수하는 경우가 아니며, 과목 개설의 전체 취지가 창업교육과 관련되어 개설된 과목일 경우만 작성
2) 교양과목 : 창업에 관한 이론 또는 기업가마인드 함양 등 창업 일반에 관련된 내용으로 편성된 교양과목
3) 전공과목 : 경영학, 인문사회, 공학, 예·체능 등 각 전공영역에서 창업과 연관하여 편성된 전공과목
4) 실습과목: 수업내용의 절반이상이 구체적인 사업 아이템을 중심으로 사업계획서 작성, 조별 모의창업 실습, 시제품 개발 등의 실습을 하는 내용을 포함하도록 편성된 교과목(교양과목 및 전공과목에 반영된 교과목의 경우 제외)
5) 2011년 : 2011년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함
6) 2012년 : 2012년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함
7) 1)의 창업강좌 현황 중 강의시간의 30% 이상에 외부전문가를 배정하여 진행한 강좌 수
• 예시) 경영컨설턴트, 기술컨설턴트, 투자전문가, 마케팅전문가, 특허전문가, 성공기업 CEO, 창업지원기관, 기업가정신 교육전문가 등

② 창업교육센터 별도 운영 창업강좌 현황 Ent. Lecture operated by Ent. Center

구분	창업교육센터 소속 교직원수[1]	타 소속 겸직 인원수	창업교육센터 별도 운영 창업강좌 수[2]
	# of Staff in Ent Center		# of Lecture operated by Ent. Center
2011년	-	-	-
2012년	2	-	4

1) 창업교육센터 소속으로 임명된 교수 및 교직원을 말하며, 창업보육센터 등의 타 조직과 겸직하는 경우에는 타 소속 겸직 인원수에도 기재
2) 교내 해당학과에서 주관하여 개설한 강좌가 아닌, 창업교육센터가 강좌를 설계하고, 운영하며 학점이 부여되는 창업강좌 지칭

붙임1 실태조사 양식(안)

1 조직 현황 Organization

① 창업교육센터 운영지침 마련 현황 Operating Instruction

학교명	Existence of Operating Inst. 마련 여부	Issue date 지침 시행(예정)일	비고
가톨릭대학교	○	2012.06.01	• 운영지침 별첨

② 창업교육 운영위원회 설치 현황 Ent. Education Committee

학교명	Existence 설치 여부	위원장(직위)	# of Committee 위원 수	당연직[1] 위원 수	비고
가톨릭대학교	○	창업교육센터장(부교수)	10	6명	• 운영위원회 구성 별첨

1) 교무처장, 산학협력단장, 공대학장, 경영대학장, 창업교육센터장

③ 창업교육센터 전문인력 확보 현황 및 계획

구 분		'11년 2011	'12년 2012	'13년(목표) 2013(Goal)
조직명 (Name of Organization)		* 기존 조직명 기재	창업교육센터 (Ent. Center)	
총인원 (Total # of people)	정규직(a) Full time	-	3	3
	위촉직(b) part time	-	5	5
	계(A=a+b)	-	8	8
	정규직 비율 (%, a/A) Full time Ratio	-	37.5	37.5
전문인력[1] (Professionals)	정규직(B) Full time	-	2	2
	위촉직(c) Part time	-	4	4
	계(B+c)	-	6	6
	전문인력 확보율 (%, B/A) Professionals Ratio	-	25	25

1) 전문 인력 : 창업교육 전담교원, 창업 관련 학위 소지자, 일정기간 이상 창업관련 기관 근무 경력자, 창업 경험자 등 통상적으로 창업교육, 멘토링, 상담 등 단순 행정업무가 아닌 창업교육센터의 고유 기능 및 역할을 수행할 수 있는 자

② 교외창업프로그램 참여 현황 : participating outside activities

구분	교외프로그램 참여 현황[1]									
	competition 경진대회		forum, seminar 포럼, 세미나 컨퍼런스 등		field trip 현장견학 / 현장체험 등		Internship 인턴십		Etc. 기타	
	횟수	참가인원	횟수	참가인원	횟수	참가인원	횟수	참가인원	횟수	참가인원
2011년[2]	-	-	-	-	-	-	9	20	-	-
2012년[3]	-	-	-	-	1	16	13	19	-	-

1) 교외프로그램 참여현황(학교가 참여학생 등에게 참가비 등 재정적 지원을 하여 참여한 경우)
- 현장견학 · 현장체험 등 : 창업관련 로드쇼, 페스티벌, 박람회, 엑스포, 멘토링 등 대학생을 대상으로 창업과 관련된 현장체험의 기회 등을 제공하는 제반 형식 참여횟수
- 인턴십 : 창업에 관심이 있는 대학생들을 대상으로 창업(벤처)기업 등 기업체에서 창업에 필요한 프로세스 및 실무경험을 쌓도록 지원하는 인턴십 프로그램
- 기타 : 학교에서 창업교육 관련하여 교육효과가 예상되어 참여한 프로그램 횟수

2) 2011년 : 2011년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

3) 2012년 : 2012년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

③ 창업동아리 현황 Student Startup Club

구분	# of Club 동아리 수[1]	# of students in Club 동아리 참여인원 수[2]	Total supporting Budget 지원예산[3]
2011년[4]	16	170	343,699,000
2012년[5]	16	182	400,000,000

1) 대학에 등록을 하고 지도교수가 있으면서 창업에 대한 학습, 교육, 실무 등을 통해 학교로부터 지원을 받는 동아리를 지칭함

2) 위의 항목 1의 동아리에 등록되어 있는 인원 수

3) 창업교육 및 실습, 공간제공 등 학교에서 창업동아리 운영을 위해 지원되는 모든 예산을 총괄하여 기재

4) 2011년 : 2011년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

5) 2012년 : 2012년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

멘토링 분야[1] Field of Mentoring		# of Mentors 멘토 수[2]	# of Mentoring to students 멘토링 실시 횟수[3]
Management 경영전설팅 (인사,조직,재무 ,마케팅 등)	2011년[4]	-	-
	2012년[5]	-	-
Tech / IT 기술/IT	2011년	-	-
	2012년	-	-
Law 법률	2011년	-	-
	2012년	-	-
Acct. / Tax 회계/세무	2011년	-	-
	2012년	-	-
Others 기타 일반상담	2011년	-	-
	2012년	-	-

1) 멘토링 분야는 경영컨설팅(인사,조직,재무,마케팅 등), 기술/IT, 법률, 세무, 기타 일반상담 등의 전문분야를 지칭하여 위에 해당하지 않는 분야는 별도 기재할 수 있음

2) 멘토링 Pool은 교내 및 외부 교수, 외부(동문포함 기업가, 벤처캐피탈리스트, 엔젤 투자자 , 기타 창업교육센터에서 해당 전문성을 인정하는 자 등으로 구성

3) 멘토링 실시횟수는 위의 해당 기간 내 멘토링 Pool내 전문가가 사전 지정된 멘티를 대상으로 멘토링을 실시한 경우를 말함.특강 형식의 단체 멘토링은 제외함)

4) 2011년 : 2011년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

5) 2012년 : 2012년도 정규학기(1, 2학기) 및 방학기간(계절학기 포함) 등을 모두 포함

* 학교별 보유중인 멘토 Pool (소속/성명/연락처(전화,이메일)/멘토링분야/주요경력 등) 첨부

Snapshot of the University Entrepreneurship Survey (above)

- Student Satisfaction Survey captures satisfaction of students across categories such as perceived service quality, self-efficacy, student loyalty, entrepreneurial intention & career reason. 4700 responses were captured using a 7-point scale.

Survey Items

Perceived Service Quality
1. My Entrepreneurship class' s physical facilities are visually appealing.
2. My Entrepreneurship class has modern equipment.
3. Materials associated with the class (such as handouts and syllabi) are visually appealing.
4. My professors are professional and neat-appealing.
5. My Entrepreneurship professors do NOT give me personal attention.
6. My Entrepreneurship professors do NOT know what I need in class.
7. My Entrepreneurship professors are consistently courteous with me.
8. My Entrepreneurship professors are enough supported by school in order to make a good class for students.
9. I feel trust while my professors are recording my grades.
10. My professors keep error-free records on grade and attendance.
11. It is difficult to get prompt service from my professors.
12. My professors are NOT always willing to help me.
13. My professors are TOO busy to respond to my requests.
14. I trust my Entrepreneurship professors.
15. I do NOT expect class schedule.
16. I trust all the contents during the lecture.
17. My professors provide their education services at the time they promise to do so.
18. My Entrepreneurship professors do NOT give me individual attention.
19. When my professors promise to do something by a certain time, they do so.
20. The Entrepreneurship classes solve my entrepreneurial agony.
21. The class does NOT understand my specific interests and needs.
22. The class schedule is NOT convenient to students.
23. My Entrepreneurship class provides various options with opening diversified courses.
24. My Entrepreneurship class has outside professionals and guest speakers besides lectures.
25. My Entrepreneurship class has various educational methods besides lectures.
26. My Entrepreneurship class has various entrepreneurial supporting programs besides lectures.

Student Satisfaction
1. I am satisfied with my decision to attend this Entrepreneurship class.
2. If have a choice to do it all over again, I still will enroll in this class.
3. My choice to enroll in this class is a wise one.
4. I am happy on my decision to enroll in this class.
5. I did the right decision when I decided to enroll in this class.
6. I am happy that I enrolled in this class.

Self Efficacy
1. Conceive a unique idea for a business.
2. Identify market opportunities for a new business.
3. Plan a new business.
4. Write a formal business plan.
5. Raise money to start a business.
6. Convince others to invest in your business.
7. Convince a bank to lend you money to start a business.
8. Convince others to work for you in your startup business.
9. Manage a small business.
10. Grow a successful business.

Student Royalty
1. I am so proud of taking the Entrepreneurship Class.
2. I want to spread this entrepreneurship class to others.
3. I recommend this entrepreneurship class to those I know.
4. After finishing this class, I hope I would have opportunity to take other Entrepreneurship classes again.
4. After finishing this class, I have intention to participate entrepreneurial activities(Business plan competition, camp etc.).
6. After finishing the class, I will pay attention to entrepreneurship education/class.

Entrepreneurial Intention
1. I will probably own my own business one day.
2. It is likely that I will personally own a small business in the relatively near future.
3. Being "my own boss" is an important goal of mine.
4. I often think of having my own business.

Career Reason
1. To challenge myself.
2. To fulfill a personal vision.
3. Grow and learn as a person.
4. To lead and motivate others.
5. Power to influence an organization.
6. Earn a larger personal income.
7. Financial security.
8. Build great wealth, high income.
9. Build business children can inherit.
10. To continue a family tradition.
11. Follow example of a person I admire.
12. To be respected by my friends.
13. Innovative, forefront of technology.
14. To develop an idea for a product.
15. I Achieve something, get recognition.
16. Gain a higher position for myself.
17. Get greater flexibility for personal life.
18. Free to adapt my approach to work.

■ Individual Data

SEX	☐ Male	☐ Female			
AGE					
Grade	☐ 1 (Freshman)	☐ 2	☐ 3	☐ 4	
GPA	☐ below2.0	☐ 2.1 ~ 3.0	☐ 3.1 ~ 3.9	☐ Above 4.0	
Major	☐ Art/Physical Edu	☐ Social Science	☐ Liberal Art	☐ Engineering	☐ Science
Reason to take Ent Class	☐ Course work	☐ Interest	☐ Recommended	☐ other benefits	
Experience Ent Class taking	☐ 1	☐ 2~3	☐ more than 4	☐ Never	

※You can choose more than one answer and you can also leave it blank if not related.

Activity Experience	☐ Nothing	☐ Part time	☐ Start up	☐ Internship	
Entrepreneur near by me	☐ Family	☐ Senior mate	☐ Friend	☐ Others( )	
Reason to take Ent Class	☐ Course work	☐ Interest	☐ Recommended	☐ other benefits	
Experience to apply Ent Support	☐ In School	☐ Government support	☐ Corporation support		
Experience Ent Activities	☐ Ent Club	☐ Biz Plan Competition	☐ Camp	☐ Seminar, Forum	☐ Mentoring

Snapshot of the Student Satisfaction Survey (above)

Empirical Analysis

Using OLS regression technique treating student satisfaction as the dependent variable and the various centre-level factors as independent variables, the change in student satisfaction due to a unit change in various centre-level factors will be measured at different levels of significance.

Econometric Model

Y(student satisfaction) = $\beta_0 + \beta_1$ ***(Funding)*** $+ \beta_2$ ***(Program Type)*** $+ \beta_3$ ***(Activity Level)*** $+ \beta_4$ ***(Faculty)*** $+ \beta_5$ ***(Entrepreneurship Committee factor)*** $+ \beta_6$ ***(Student GPA)…..+ other important control variables***

For the preliminary analysis, 2 dependent variables were chosen namely Self Efficacy and Entrepreneurial Intention. In the student satisfaction survey, these two variables most closely capture the student experience or satisfaction resulting from the entrepreneurship programs.

The student survey contained 10 questions for evaluating Self Efficacy and 4 questions for evaluating Entrepreneurial Intention. Moreover, these questions were highly similar. The first challenge was to reduce the dependent variables to one single representative index or variable that captures the overall effect of the dependent variable.

After conducting pairwise correlation analysis for these similar questions it was found that there was a fairly high level of correlation between the questions for both dependent variables. Results of the pairwise correlation analysis are shown below:

(where se1-se10 stand for the 10 Self Efficacy questions and ei1-ei4 represent the 4 Entrepreneurial Intention questions in the student survey)

```
. corr  se1 se2 se3 se4 se5 se6 se7 se8 se9 se10
(obs=4428)
```

	se1	se2	se3	se4	se5	se6	se7	se8	se9	se10
se1	1.0000									
se2	0.7354	1.0000								
se3	0.6548	0.6998	1.0000							
se4	0.5844	0.6500	0.6846	1.0000						
se5	0.4588	0.5129	0.4914	0.5914	1.0000					
se6	0.5394	0.5794	0.5448	0.6423	0.7527	1.0000				
se7	0.3842	0.4539	0.4037	0.4899	0.5652	0.6219	1.0000			
se8	0.4422	0.4347	0.4278	0.4566	0.4044	0.5155	0.4453	1.0000		
se9	0.5319	0.5502	0.5261	0.5926	0.5177	0.6269	0.5310	0.6447	1.0000	
se10	0.5556	0.5570	0.5445	0.5560	0.4662	0.5776	0.4414	0.5758	0.7645	1.0000

```
. corr  ei1 ei2 ei3 ei4
(obs=4421)
```

	ei1	ei2	ei3	ei4
ei1	1.0000			
ei2	0.7024	1.0000		
ei3	0.7022	0.6645	1.0000	
ei4	0.7751	0.6582	0.7145	1.0000

Results of the Regression Analysis

	(1) avgse	(2) avgse	(3) avgse	(4) avgse	(5) avgse	(6) avgse
commember	0.0224*	0.0256**	0.0285**	0.0218*	0.0302	0.00908
	(2.46)	(2.79)	(3.04)	(2.10)	(1.72)	(0.46)
gpa	-0.0290	-0.0235	-0.0225	-0.00524	-0.0411	-0.0564
	(-0.93)	(-0.75)	(-0.72)	(-0.16)	(-0.92)	(-1.25)
gender	0.246***	0.245***	0.240***	0.208***	0.284***	0.286***
	(6.14)	(6.12)	(5.97)	(4.89)	(4.81)	(4.86)
age	0.0732***	0.0716***	0.0699***	0.0773***	0.0659***	0.0659***
	(9.09)	(8.88)	(8.59)	(8.94)	(5.43)	(5.44)
major	-0.0257	-0.0246	-0.0245	-0.0164	-0.0252	-0.0216
	(-1.60)	(-1.53)	(-1.53)	(-0.98)	(-1.12)	(-0.96)
stafsupp		0.0145**	0.0124*	0.0186***	0.0220	0.00526
		(2.89)	(2.39)	(3.39)	(1.04)	(0.24)
offspace			0.0000797	0.0000987	0.0000754	0.0000549
			(1.56)	(1.79)	(0.94)	(0.68)
govgrant_log				-0.0158	-0.0606***	-0.0621***
				(-1.34)	(-3.54)	(-3.63)
schoolgran~g					0.197***	0.193***
					(3.89)	(3.81)
eclecno						-0.0125*
						(-2.26)
_cons	2.450***	2.346***	2.333***	2.266***	0.963	1.459*
	(11.87)	(11.22)	(11.15)	(9.09)	(1.70)	(2.40)
N	2816	2816	2816	2582	1462	1462

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

In the table above, avgse or Self Efficacy is regressed on No of committee members in Entrepreneurship Education Committee (commember), total no of support staff (staffsupp), office space provided to startups (offspace), government grant provided to entrepreneurship centre (govgrant_log), school grant (schoolgrant_log) and total entrepreneurship lectures conducted by the centre (eclecno). Control variables included student GPA, gender, age and major.

- No of committee members has a positive effect on dependent variable but its effect decreases as more independent variables are added
- Gender and age also have a positive & significant effect on dependent variable.
- Surprisingly, amount of government grant has negative impact on student experience while school grant has positive and practically significant effect on dependent variable

	(1) avgei	(2) avgei	(3) avgei	(4) avgei	(5) avgei	(6) avgei
commember	0.0315*	0.0289*	0.0352**	0.0130	0.0324	0.0152
	(2.43)	(2.22)	(2.65)	(0.88)	(1.27)	(0.53)
gpa	-0.164***	-0.168***	-0.166***	-0.142**	-0.171**	-0.184**
	(-3.69)	(-3.78)	(-3.73)	(-3.01)	(-2.64)	(-2.80)
gender	0.253***	0.254***	0.243***	0.229***	0.364***	0.366***
	(4.43)	(4.45)	(4.25)	(3.80)	(4.25)	(4.28)
age	0.113***	0.114***	0.111***	0.119***	0.0846***	0.0847***
	(9.86)	(9.96)	(9.55)	(9.65)	(4.80)	(4.81)
major	-0.125***	-0.126***	-0.126***	-0.0939***	-0.0610	-0.0582
	(-5.46)	(-5.50)	(-5.49)	(-3.92)	(-1.87)	(-1.78)
stafsupp		-0.0118	-0.0163*	-0.00475	-0.0217	-0.0359
		(-1.67)	(-2.22)	(-0.61)	(-0.70)	(-1.10)
offspace			0.000171*	0.000118	0.00000257	-0.0000145
			(2.35)	(1.50)	(0.02)	(-0.12)
govgrant_log				-0.0732***	-0.0489*	-0.0501*
				(-4.37)	(-1.96)	(-2.01)
schoolgran~g					-0.0676	-0.0716
					(-0.92)	(-0.97)
eclecno						-0.0103
						(-1.29)
_cons	2.441***	2.524***	2.497***	3.043***	4.212***	4.628***
	(8.31)	(8.48)	(8.38)	(8.58)	(5.11)	(5.23)
N	2832	2832	2832	2596	1468	1468

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

In this regression, we change the dependent variable to avgei or Entrepreneurial Intention.

- GPA is highly significant factor when we change the dependent variable to Entrepreneurial Intention and has a negative impact. This means that students with higher GPA have less motivation to undertake entrepreneurial careers esp. right after finishing school.
- Major is the other variable that becomes active when dependent variable is changed. It has negative impact and thus as we move from majors Art/Physical edu to Engineering, the student satisfaction seems to decrease.
- Gender & GPA continue to have a positive and significant impact on dependent variable. Female students have higher satisfaction than male students.
- Government grant continues to have significant & negative impact on dependent variable but school grant changes from positive to negative coefficient but is no longer significant.

Regression Results with addition of more Student Startup variables

	(1) avgse	(2) avgse	(3) avgse	(4) avgse	(5) avgse	(6) avgse	(7) avgse
commember	0.0224*	0.0256**	0.0285**	0.0218*	0.0302	0.00908	-0.00621
	(2.46)	(2.79)	(3.04)	(2.10)	(1.72)	(0.46)	(-0.18)
gpa	-0.0290	-0.0235	-0.0225	-0.00524	-0.0411	-0.0564	-0.0549
	(-0.93)	(-0.75)	(-0.72)	(-0.16)	(-0.92)	(-1.25)	(-1.22)
gender	0.246***	0.245***	0.240***	0.208***	0.284***	0.286***	0.286***
	(6.14)	(6.12)	(5.97)	(4.89)	(4.81)	(4.86)	(4.86)
age	0.0732***	0.0716***	0.0699***	0.0773***	0.0659***	0.0659***	0.0657***
	(9.09)	(8.88)	(8.59)	(8.94)	(5.43)	(5.44)	(5.42)
major	-0.0257	-0.0246	-0.0245	-0.0164	-0.0252	-0.0216	-0.0214
	(-1.60)	(-1.53)	(-1.53)	(-0.98)	(-1.12)	(-0.96)	(-0.93)
stafsupp		0.0145**	0.0124*	0.0186***	0.0220	0.00526	-0.0542
		(2.89)	(2.39)	(3.39)	(1.04)	(0.24)	(-1.42)
offspace			0.0000797	0.0000987	0.0000754	0.0000549	0.000105
			(1.56)	(1.79)	(0.94)	(0.68)	(0.94)
govgrant_log				-0.0158	-0.0606***	-0.0621***	-0.0541
				(-1.34)	(-3.54)	(-3.63)	(-1.71)
schoolgran~g					0.197***	0.193***	0.0512
					(3.89)	(3.81)	(0.47)
eclecno						-0.0125*	-0.00924
						(-2.26)	(-0.59)
ststartclub							0.00728
							(0.66)
ststartnostu							-0.00140*
							(-2.16)
ststartbud~t							0.00000105
							(1.31)
_cons	2.450***	2.346***	2.333***	2.266***	0.963	1.459*	3.302*
	(11.87)	(11.22)	(11.15)	(9.09)	(1.70)	(2.40)	(2.04)
N	2816	2816	2816	2582	1462	1462	1462

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

	(1) avgei	(2) avgei	(3) avgei	(4) avgei	(5) avgei	(6) avgei	(7) avgei
commember	0.0315*	0.0289*	0.0352**	0.0130	0.0324	0.0152	-0.0144
	(2.43)	(2.22)	(2.65)	(0.88)	(1.27)	(0.53)	(-0.28)
gpa	-0.164***	-0.168***	-0.166***	-0.142**	-0.171**	-0.184**	-0.178**
	(-3.69)	(-3.78)	(-3.73)	(-3.01)	(-2.64)	(-2.80)	(-2.71)
gender	0.253***	0.254***	0.243***	0.229***	0.364***	0.366***	0.361***
	(4.43)	(4.45)	(4.25)	(3.80)	(4.25)	(4.28)	(4.23)
age	0.113***	0.114***	0.111***	0.119***	0.0846***	0.0847***	0.0843***
	(9.86)	(9.96)	(9.55)	(9.65)	(4.80)	(4.81)	(4.78)
major	-0.125***	-0.126***	-0.126***	-0.0939***	-0.0610	-0.0582	-0.0437
	(-5.46)	(-5.50)	(-5.49)	(-3.92)	(-1.87)	(-1.78)	(-1.31)
stafsupp		-0.0118	-0.0163*	-0.00475	-0.0217	-0.0359	-0.108
		(-1.67)	(-2.22)	(-0.61)	(-0.70)	(-1.10)	(-1.93)
offspace			0.000171*	0.000118	0.00000257	-0.0000145	0.0000378
			(2.35)	(1.50)	(0.02)	(-0.12)	(0.23)
govgrant_log				-0.0732***	-0.0489*	-0.0501*	-0.0352
				(-4.37)	(-1.96)	(-2.01)	(-0.76)
schoolgran~g					-0.0676	-0.0716	-0.236
					(-0.92)	(-0.97)	(-1.48)
eclecno						-0.0103	-0.00557
						(-1.29)	(-0.24)
ststartclub							-0.00261
							(-0.16)
ststartnostu							-0.000646
							(-0.68)
ststartbud~t							0.00000229
							(1.95)
_cons	2.441***	2.524***	2.497***	3.043***	4.212***	4.628***	6.759**
	(8.31)	(8.48)	(8.38)	(8.58)	(5.11)	(5.23)	(2.87)
N	2832	2832	2832	2596	1468	1468	1468

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Heteroskedasticity & Robust Results

```
. estat nettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of avgse

         chi2(1)      =    25.89
         Prob > chi2  =   0.0000
```

```
. estat nettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of avgei

         chi2(1)      =     3.17
         Prob > chi2  =   0.0751
```

- The test results clearly show presence of high degree heteroskedasticity in the dependent variable avgse i.e Self Efficacy. On the other hand, the level of heterskedasticity in the other dependent variable Entrepreneurial Intention (avgei) is much lower. Infact, it's a borderline case and we cannot conclude that there is presence of heteroskedasticity for Entrepreneurial Intention.

To avoid any discrepancy, clustered robust results were also estimated

Linear regression

Number of obs	1462
F(11, 12)	.
Prob > F	.
R-squared	0.0875
Root MSE	.98469

(Std. Err. adjusted for 13 clusters in center)

avgse	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
commember	-.0062135	.0459782	-0.14	0.895	-.1063913	.0939643
stafsupp	-.0542034	.0851903	-0.64	0.537	-.2398172	.1314104
offspace	.0001051	.0001652	0.64	0.537	-.0002548	.0004649
govgrant_log	-.0540652	.0395892	-1.37	0.197	-.1403228	.0321923
schoolgrant_log	.0512025	.186334	0.27	0.788	-.3547844	.4571893
eclecno	-.0092439	.0222082	-0.42	0.685	-.0576314	.0391436
ststartclub	.007284	.0151592	0.48	0.640	-.0257449	.040313
ststartnostu	-.0014036	.0009206	-1.52	0.153	-.0034094	.0006022
ststartbudget	1.05e-06	1.08e-06	0.98	0.346	-1.29e-06	3.40e-06
gpa	-.0549023	.0324369	-1.69	0.116	-.1255764	.0157717
gender	.2857943	.0980508	2.91	0.013	.07216	.4994286
age	.065711	.0101655	6.46	0.000	.0435622	.0878598
major	-.021388	.0218524	-0.98	0.347	-.0690003	.0262244
_cons	3.302492	2.714465	1.22	0.247	-2.61182	9.216804

Linear regression

Number of obs	1468
F(11, 12)	.
Prob > F	.
R-squared	0.0766
Root MSE	1.4323

(Std. Err. adjusted for 13 clusters in center)

avgei	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
commember	-.01445	.0302339	-0.48	0.641	-.0803241	.0514241
stafsupp	-.1079492	.0512617	-2.11	0.057	-.2196387	.0037404
offspace	.0000378	.0000893	0.42	0.680	-.0001568	.0002324
govgrant_log	-.035205	.0300115	-1.17	0.264	-.1005944	.0301845
schoolgrant_log	-.236406	.1238411	-1.91	0.080	-.5062325	.0334206
eclecno	-.0055735	.0172487	-0.32	0.752	-.0431551	.0320082
ststartclub	-.0026131	.0129588	-0.20	0.844	-.030848	.0256218
ststartnostu	-.0006457	.0005855	-1.10	0.292	-.0019213	.00063
ststartbudget	2.29e-06	6.66e-07	3.44	0.005	8.43e-07	3.75e-06
gpa	-.1779342	.0452587	-3.93	0.002	-.2765444	-.0793239
gender	.3609681	.0759165	4.75	0.000	.1955602	.526376
age	.0843047	.0174394	4.83	0.000	.0463075	.122302
major	-.0436921	.0485363	-0.90	0.386	-.1494436	.0620594
_cons	6.758602	1.880225	3.59	0.004	2.661944	10.85526

Conclusion

- Gender & Age have a significant & positive impact on student satisfaction for both dependent variables
- Government grant has negative & significant impact

Student satisfaction is not affected by most centre level factors.

Due to the limitation of the data collected and hence the resultant analysis, more data points and clear path for future research on efficacy of entrepreneurship programs must be charted out.

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